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09/689,475	10/13/2000	Feng Liang	200-0163	7736

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EXAMINER

LAM, THANH

ART UNIT

PAPER NUMBER

2834

DATE MAILED: 12/14/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.  
**09/689,475**

Applicant(s)  
**Liang et al.**

Examiner  
**Thanh Lam**

Art Unit  
**2834**



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some\* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)                      18) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)                      19) ☐ Notice of Informal Patent Application (PTO-152)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 2                      20) ☐ Other:

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## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 2-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
3. Claims 2-8 recite the limitations "a plurality of sensing slots" and "a desired saliency" in claims 2-8. There are insufficient antecedent basis for these limitations in the claims.
4. Claims 4-5 recite the limitation "a plurality of sensing slots uniformly spaced around the rotor" in claims 4-6. There is insufficient antecedent basis for this limitation in the claims.

### *Claim Rejections - 35 USC § 102*

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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6. Claims 1-6, and 8-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Jansen et al. (pn. 5,585,709).

Regarding method claims 1-8, Jansen et al. disclose a method for modifying an electric machine drive rotor having a stator to create rotor position dependent saliency and allow sensorless control, the method comprising the step of: providing a plurality of sensing slots (121,122) around the rotor, wherein said plurality of sensing slots create a desired saliency.

Regarding claim 2, the step of providing a plurality of sensing slots uniformly spaced around the rotor (the slot 121 and 122 are spaced evenly).

Regarding claim 3, the step of providing a plurality of sensing slots variably spaced in a repeating manner (144 of fig. 17) around the rotor.

Regarding claim 4, each of said plurality of sensing slots has a uniform width and depth around the rotor (144 slots are equal in size, or a and b of fig. 13A-B).

Regarding claim 5, each of said plurality of sensing slots has a uniform width (b fig. 14-15) around the rotor, wherein the depth (a, fig. 14-15) of each of said plurality of sensing slots varies in a repeating manner around the rotor.

Regarding claim 6, each of said plurality of sensing slots has a uniform depth (a fig. 15 and 16A) around the rotor, wherein the width (b fig. 15 and 16b) of each of said plurality of sensing slots varies in a repeating manner around the rotor.

Regarding claim 8, said plurality of sensing slots are coupled with a plurality of stator slots of a stator to create the desired saliency.

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Regarding claims 9 and 16, Jansen et al. disclose a sensorless control electric machine drive comprising: a stator (110) having a plurality of stator slots; and a rotor having a plurality of rotor sensing slots ( 121,122) located along its outer periphery, wherein said plurality of stator slots and said plurality of rotor sensing slots are coupled to create a desired saliency.

Regarding claim 10, said plurality of rotor sensing slots are spaced uniformly around the outer periphery of said rotor (the slots 121 and 122 are spaced evenly).

Regarding claims 11 and 17, said plurality of rotor sensing slots are variably spaced (144 fig. 17) in a repeating pattern around the outer periphery of said rotor.

Regarding claims 12,19, and 22-23, said repeating pattern comprises a sinusoidal repeating pattern (see the slots 155 and 156 of fig. 18 are orderly increasing in depth)

Regarding claim 13, the depth of said plurality of rotor sensing slots is varied (see the depth of slots 155 and 156 of fig. 18) in a repeating pattern around said rotor.

Regarding claims 14 and 20-21, the width of said plurality of rotor sensing slots is varied (121,122) in a repeating pattern around said rotor.

Regarding claims 15 and 24, the sensorless control electric machine drive is selected from the group consisting of a sensorless control induction machine and a buried permanent magnet synchronous machine ( 164, fig. 20).

Regarding claim 18, a plurality of sensing slots variably spaced in a repeating manner (144 of fig. 17) around the outer periphery rotor.

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***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jansen et al. in view of Boyer (pn. 4,485,796).

Jansen et al. disclose every aspect of claimed invention except for a post assembly step.

? Morrill discloses a post assembly step (col. 2, lines 15-20)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the step providing sensing slots of the rotor as taught by Jansen and including a step of post assembly as disclosed by Boyer for an ease of assembly.

***Conclusion***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh Lam whose telephone number is (703) 308-7626. The fax phone number for this Group is (703) 305-3431.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0656.

A handwritten signature in cursive script, appearing to read 'Thanh Lam', with a long horizontal flourish extending to the left.

Thanh Lam

Patent Examiner

Dec. 11, 2001